## H. TYPHOON JUNE (010600Z-081200Z AUGUST 1961)

AFTER THE DEPARTURE OF IDA FROM THE STAGE, WHILE HELEN WAS PERFORMING A LAST SCENE BY THE WINGS, JUNE APPEARED ON THE CENTER OF THE STAGE AS IF FROM MID AIR ON THE 301200Z SURFACE STREAMLINE CHART AS A CLOSED VORTEX NEAR 10N 141E. COMPARATIVELY LIGHT WINDS AROUND THE CYCLONE AND PREOCCUPATION WITH HELEN AND IDA CAUSED RECONNAISSANCE TO ARRIVE AFTER INTENSIFICATION COMMENCED, FOR THE RECONNAISSANCE AIRCRAFT REPORTED 50 KT WINDS AT 010430Z AND THE FIRST STORM WARNING ON JUNE WAS ISSUED AT 010600Z WITH 50 KT SURFACE WINDS NEAR THE CENTER.

JUNE PROGRESSED TO THE NW AT SPEEDS OF 6 TO 9 KTS AND INTENSIFIED TO TYPHOON STRENGTH AT 020000Z, HAD SURFACE WINDS OF 75 KTS BY 021800Z, THEN THE SURFACE WIND SPEEDS DECREASED BY 5 KTS 12 HOURS LATER. AT 041200Z THE SURFACE WIND SPEEDS DECREASED TO MINIMUM TYPHOON STRENGTH, REMAINED THERE FOR 12 HOURS THEN THE TYPHOON BEGAN A SLOW INTENSIFICATION OF SURFACE WIND SPEEDS TO 100 KTS BY 060600Z. THIS WEAKENING, THEN RE-INTENSIFICATION CORRESPONDS TO THE PARTIAL DISSIPATION OF THE WALL CLOUDS, THE RISE IN SURFACE PRESSURE AND 700 MB HEIGHT, AND THE DECREASE OF 700 MB TEMPERATURE ON 4 AUGUST. THE LAPSE RATE BETWEEN THE 700 MB LEVEL AND THE SURFACE INDICATED A SUBSTANTIAL COOLING AT ALL LEVELS WITH A MAXIMUM OF $7^{\circ}$ TO $8^{\circ}$ C FROM THE 860 TO THE 800 MB LEVEL BETWEEN 040900Z AND 042300Z. AN AVERAGE OF THE TEMPERATURE FOR EVERY 50 MB FROM THE SURFACE THROUGH 700 MB AT 040900Z INDICATED A TEMPERATURE OF $23.2^{\circ}$ C AND A DEW POINT OF $16.6^{\circ}$ C. AT 042300Z THE TEMPERATURE AVERAGE BY THE SAME METHOD WAS $19.0^{\circ}$ C AND THE DEW POINT WAS $18.5^{\circ}$ C. THE SOUNDING WARMED UP AGAIN AFTER 050400Z. THERE APPEARED TO BE SUBSTANTIAL SUBSIDENCE RESULTING IN A DRY LAPSE RATE FROM 763 TO 700 MB AT 040400Z, NO SUBSIDENCE AT 042300Z, THEN THE 060400Z SOUNDING INDICATED SUBSIDENCE TO BE WELL ESTABLISHED AND SUFFICIENT TO PRODUCE A DRY LAPSE RATE FROM 745 TO 700 MB.

JUNE PASSED 35 MI TO THE NE OF BATAN ISLAND AT 052200Z. THE U. S. COAST GUARD LORAN STATION AT BATAN PROVIDED SPECIAL OBSERVATIONS DURING THIS PERIOD, AND REPORTED A MINIMUM SEA LEVEL PRESSURE OF 996.7 MB, AND A SURFACE WIND OF ONLY 12 KTS WITH NO GUSTS, REVEALING THAT THE LEFT QUADRANT AND MOST OF THE LEFT SEMICIRCLE OF JUNE WAS VERY WEAK.

A WEAK SECONDARY LOW APPEARED IN THE TAIWAN STRAITS JUST W OF THE N TIP OF TAIWAN ON THE 060600Z SURFACE CHART. THIS CIRCULATION WAS NEVER WELL DEFINED NOR DID IT APPEAR TO HAVE PRESSURES BELOW 1000 MB OR SURFACE WINDS IN EXCESS OF 30 KTS WHILE A SECONDARY LOW. THE TYPHOON BEGAN WEAKENING AT 061200Z WHILE 40 MI FROM LAND AND ABOUT 65 MI FROM POINT OF PASSAGE OVER THE TAIWAN COAST. THE RUGGED TERRAIN OF THE ISLAND EFFECTIVELY DESTROYED THE WIND CIRCULATION. LEAVING ONLY A WEAK SKELETON OF JUNE BY THE TIME IT PASSED OVER THE COAST AT 070300Z WITH SURFACE WIND SPEEDS OF 50 KTS THAT QUICKLY REDUCED TO 25 KTS. JUNE MOVED INTO THE SECONDARY LOW ON THE W SIDE

OF TAIWAN BETWEEN 071200Z AND 071800Z. THE CYCLONE DEVELOPED 35 KT SURFACE WINDS WHILE OVER THE STRAITS OF TAIWAN, PASSED OVER THE COAST OF THE ASIATIC MAINLAND AT 080000Z, AND HAD WINDS OF ONLY 10 TO 15 KTS WITH A SURFACE PRESSURE OF SLIGHTLY LESS THAN 1000 MB IN THE CENTER WHEN THE LAST WARNING WAS ISSUED AT 081200Z.

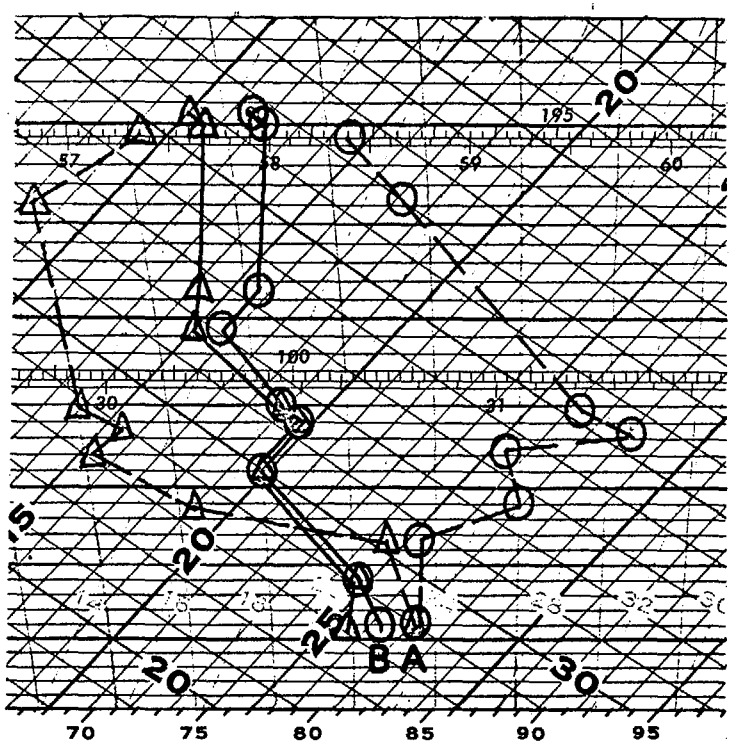
JUNE FORMED TO THE S OF THE RIDGE LINE WHICH WAS NEAR 30N AT THE 200 MB LEVEL. AN ANTICYCLONE AT THAT LEVEL WAS AT 10N 173E, JUST N OF MAJURO, WHICH EXTENDED AS FAR W AS GUAM. JUNE ALSO TRAVELED AROUND THE S AND SW SIDE OF A SURFACE ANTICYCLONE AS IT APPROACHED TAIWAN. THERE WAS EVIDENCE OF A CLOSED CYCLONIC CIRCULATION OVER JUNE ON 7-8 AUGUST TO AT LEAST 45,000 FT, BUT IT IS DIFFICULT TO SAY WITH ANY ASSURANCE THAT THIS CYCLONE WAS A DIRECT RESULT OF JUNE, OR WHETHER OTHER GENERAL CIRCULATION FACTORS WERE INVOLVED.

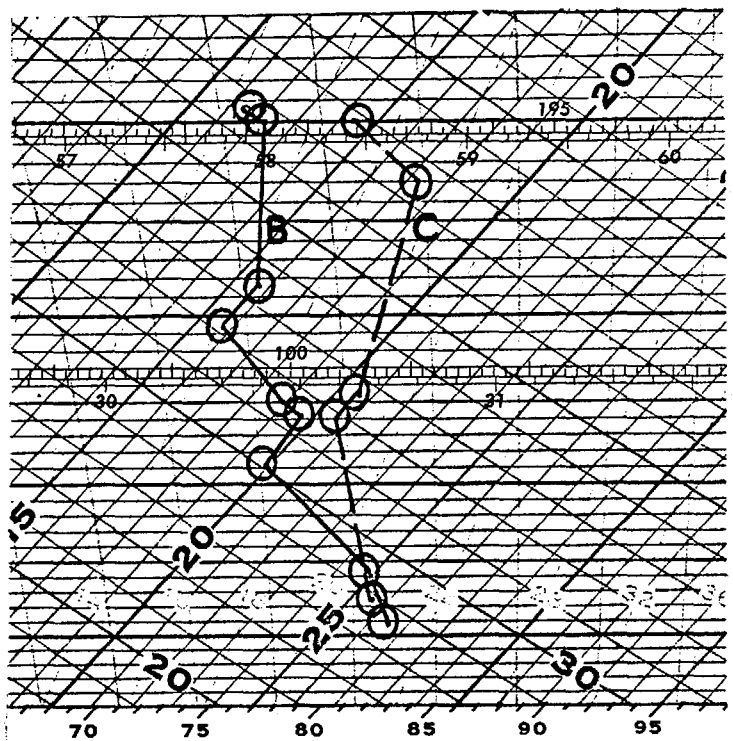
TWELVE LAND RADAR FIXES ON JUNE PROVIDED EXTREMELY ACCURATE POSITIONING OF THE TYPHOON DURING THE FEW HOURS PRIOR TO PASSING OVER THE COASTLINE OF TAIWAN.

NO GREAT DIFFICULTIES WERE INVOLVED IN FORECASTING. THE TYPHOON FOLLOWED THE SINGLE SPACE MEAN CHART REASONABLE WELL, BUT DID NOT FOLLOW THE 200 MB FLOW AFTER 3 AUGUST. THE TRACK MADE BY JUNE SATISFIES CLIMATOLOGY QUITE WELL, AND WITH THE EXCEPTION OF THE SHORT PERIOD OF WEAKENING ON 4 AUGUST VERY LITTLE OF AN UNUSUAL NATURE TRANSPIRED WORTHY OF EXCEPTIONAL NOTICE.

JUNE TRAVELED 1255 MI DURING THE 7 DAYS 6 HOURS THAT WARNINGS WERE ISSUED AT AN AVERAGE SPEED OF 173 MI PER DAY OR 7.2 KTS. THE SLOWEST SPEED OF TRAVEL WAS 3 KTS BETWEEN 061800Z AND 070000Z. THE FASTEST RATE OF TRAVEL WAS 11 KTS BETWEEN 071200Z AND 071800Z. THE HIGHEST SURFACE WINDS, 100 KTS, EXISTED BETWEEN 060600Z AND 061200Z.

THE TYPHOON DELIVERED THE FULL BRUNT OF ITS FORCE TO TAIWAN AND ORCHID ISLAND, JUST E OF THE S TIP OF TAIWAN. DAMAGE IS UNKNOWN ON ORCHID ISLAND, HOWEVER THE TYPHOON PASSED DIRECTLY OVER IT. JUNE DUMPED 21.6 INCHES OF RAIN ON SOUTHERN TAIWAN, TWENTY PERSONS WERE REPORTED DEAD IN THE KAOHSIUNG-TAITUNG AREA, AND ABOUT 15,000 PEOPLE WERE LEFT HOMELESS. ABOUT 5,000 ACRES OF LAND WERE FLOODED ALONG THE LOVE RIVER WHICH OVERFLOWED ITS BANKS. LANDSLIDES BLOCKED HIGHWAYS BETWEEN TAITUNG AND HUALIEN. ABOUT 30 PERCENT OF THE TELEPHONES AT KAOHSIUNG WERE OUT OF ORDER AND TWO SMALL FACTORIES COLLAPSED UNDER THE FORCE OF WINDS AND RAIN. THE CITY OF KAOHSIUNG, HEAVIEST HIT ON TAIWAN WHEN THE LOVE RIVER OVERFLOWED, WAS DECLARED AN EMERGENCY AREA AND NATIONALIST CHINESE TROOPS PERFORMED RESCUE WORK THERE.



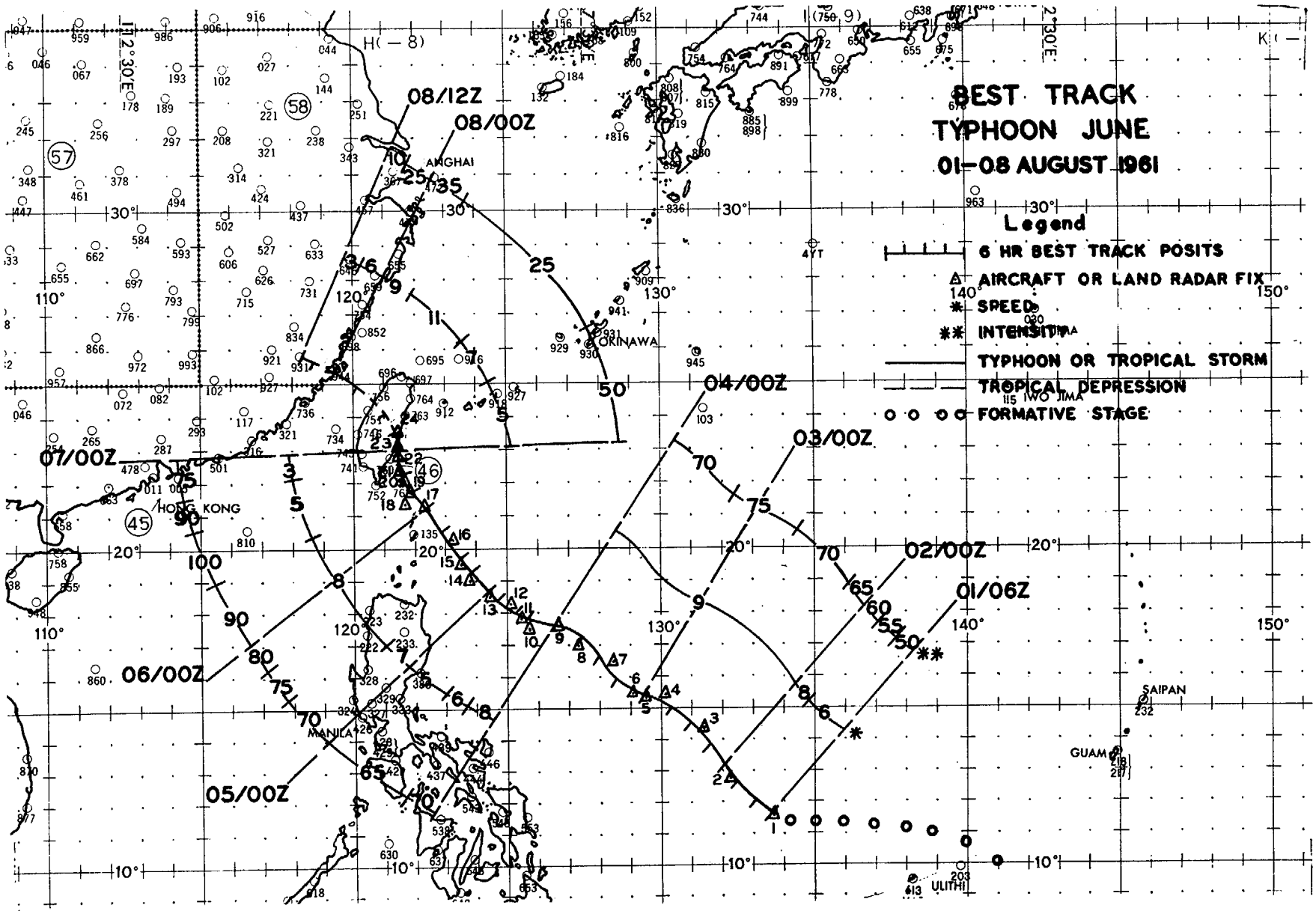

SOUNDING A(DASHED) 040900Z, T AND $T_D$

SOUNDING B(SOLID) 042300Z, T AND $T_D$

NOTE: THE 850MB LEVEL, SOUNDING B HAS A $\theta_E$ THAT IS 4°C WARMER THAN THE CORRESPONDING LEVEL FOR SOUNDING A.

SOUNDING B(SOLID) 042300Z, T ONLY

SOUNDING C(DASHED) 050930Z, T ONLY


BEST TRACK
TYPHOON JUNE
01–08 AUGUST 1961
Legend
6 HR BEST TRACK POSITS
AIRCRAFT OR LAND RADAR FIX
* SPEED
** INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
FORMATIVE STAGE
08/12Z
08/00Z
04/00Z
03/00Z
02/00Z
01/06Z
01/00Z
06/00Z
05/00Z
SHANGHAI
OKINAWA
HONG KONG
MANILA
SAIPAN
GUAM
ULITHI
IWO JIMA
112°30'E
110°
120°
130°
140°
150°
10°
20°
30°

## LAND RADAR AND AIRCRAFT FIXES - TYPHOON JUNE

| FIX NO. | TIME | LAT. | LONG. | UNIT METHOD & ACCY | MAX SFC WND | MAX 700MB WND | MIN 700MB HGT | MIN SLP MBS | 700MB T/TD (°C) | EYE CHARACTERISTICS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 010430Z | 11.7N | 133.8E | VW1-P-05 | 50 | --- | ----- | 990 | ------ | DIA 45MI OPEN N-E |
| 2 | 012200Z | 12.9N | 132.3E | 56-P-10 | 60 | 50 | 10000 | 992 | 12/09 | ---------- |
| 3 | 020900Z | 14.3N | 131.4E | 56-P-05 | 80 | 55 | 9960 | 987 | 15/07 | CIRC 20MI DIA |
| 4 | 021530Z | 15.3N | 130.1E | VW1-P-10 | 50 | --- | ----- | 988 | 15/09 | DIA 35MI OPEN N-E |
| 5 | 022200Z | 15.3N | 129.6E | 56-P-10 | 110 | 60 | 10090 | 988 | 15/09 | ---------- |
| 6 | 030130Z | 15.4N | 129.1E | 56-P-10 | 110 | 60 | 9980 | 984 | 15/11 | ---------- |
| 7 | 030830Z | 16.4N | 128.4E | 56-P-05 | 100 | 60 | 10060 | 998 | 14/03 | CIRC 20MI DIA WALL CLD SW |
| 8 | 031630Z | 17.0N | 127.3E | VW1-R-U | --- | --- | ----- | --- | ------ | NO DEFINITE EYE DIA 50MI |
| 9 | 032200Z | 17.6N | 126.8E | 56-P-05 | 70 | 50 | 10030 | 995 | 14/09 | 75MI DIA OPEN N & NE |
| 10 | 040330Z | 17.5N | 125.8E | 56-P-02 | 85 | 50 | 9980 | 990 | 15/00 | OPEN N & NE |
| 11 | 040845Z | 17.9N | 125.6E | 56-P-02 | 100 | 35 | 10030 | 993 | 14/10 | CIRC DIA 65MI OPEN N |
| 12 | 041540Z | 18.1N | 125.2E | VW1-R-10 | --- | --- | ----- | --- | ------ | ELLIP NW-SE AXIS 35MI LONG |
| 13 | 042230Z | 18.5N | 124.5E | 56-P-02 | 90 | 50 | 9900 | 993 | 12/11 | CIRC 35MI DIA WALL CLDS ALL QUADS |
| 14 | 050400Z | 19.0N | 123.9E | 56-P-02 | 95 | 65 | 9800 | 988 | 13/11 | CIRC DIA 35MI |
| 15 | 050930Z | 19.4N | 123.5E | 56-P-06 | 80 | 70 | 9610 | 981 | 15/05 | CIRC DIA 25MI |
| 16 | 051530Z | 20.2N | 123.2E | VW1-R-05 | --- | --- | ----- | --- | ------ | DIA 30MI |
| 17 | 052300Z | 21.2N | 122.3E | 56-P-03 | 65 | 50 | 9420 | 973 | 16/08 | CIRC 20MI DIA WELL DEFINED WALL CLDS |
| 18 | 060150Z | 21.3N | 121.9E | 56-P-01 | 100 | 70 | 9250 | --- | 12/12 | CIRC 20MI DIA |
| 19 | 060400Z | 21.5N | 121.9E | 56-P-03 | 100 | 75 | 9230 | 964 | 17/07 | CIRC 10MI DIA |
| 20 | 060845Z | 22.0N | 121.8E | 56-P-05 | 100 | 100 | 9120 | 961 | 16/06 | WELL DEFINED CIRC 25MI DIA |
| 21 | 061200Z | 22.2N | 121.6E | LND/RDR | --- | --- | ----- | --- | ------ | ---------- |

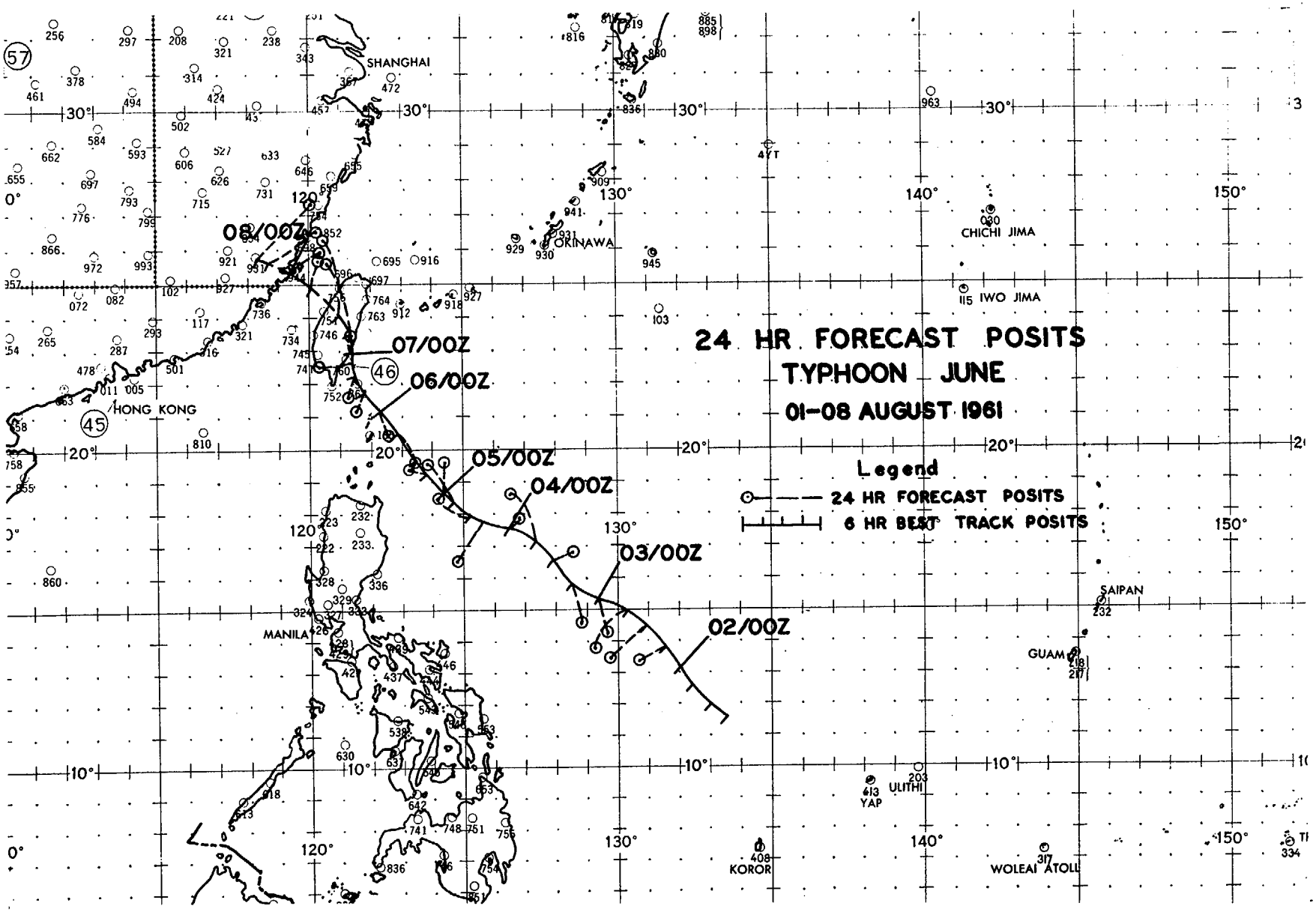
## LAND RADAR AND AIRCRAFT FIXES - TYPHOON JUNE (CONT'D)

| FIX NO. | TIME | LAT. | LONG. | UNIT METHOD & ACCY | MAX SFC WND | MAX 700MB WND | MIN 700MB HGT | MIN SLP MBS | 700MB T/Td (°C) | EYE CHARACTERISTICS |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | 061800Z | 22.7N | 121.5E | LND/RDR | --- | --- | ---- | --- | ----- | ---------- |
| 23 | 070000Z | 23.0N | 121.5E | LND/RDR | --- | --- | ---- | --- | ----- | ---------- |
| 24 | 070600Z | 23.4N | 121.4E | LND/RDR | --- | --- | ---- | --- | ----- | ---------- |

TYPHOON JUNE 01-08 AUG 1961
POSITION AND FORECAST VERIFICATION DATA

| DTG | STORM POSITION LAT. | LONG. | 24 HR. ERROR DEG. DISTANCE | 48 HR. ERROR DEG. DISTANCE |
|---|---|---|---|---|
| 010600Z | 11.8N | 133.6E | ------- | ------- |
| 011200Z | 12.1N | 133.1E | ------- | ------- |
| 011800Z | 12.5N | 132.6E | ------- | ------- |
| 020000Z | 13.1N | 132.2E | ------- | ------- |
| 020600Z | 13.9N | 131.7E | 238-73 | ------- |
| 021200Z | 14.6N | 131.0E | 224-89 | ------- |
| 021800Z | 15.0N | 130.2E | 189-87 | ------- |
| 030000Z | 15.4N | 129.3E | 158-76 | ------- |
| 030600Z | 15.8N | 128.5E | 159-72 | 232-120 |
| 031200Z | 16.6N | 128.0E | 049-33 | 231-148 |
| 031800Z | 17.3N | 127.5E | 327-93 | 226-167 |
| 040000Z | 17.6N | 126.5E | 047-31 | 168-128 |
| 040600Z | 17.7N | 125.7E | 215-91 | 189-107 |
| 041200Z | 18.0N | 125.3E | 300-69 | 214-84 |
| 041800Z | 18.3N | 124.8E | 325-90 | 341-205 |
| 050000Z | 18.6N | 124.4E | 003-53 | 005-133 |
| 050600Z | 19.2N | 123.9E | 281-43 | 089-56 |
| 051200Z | 19.8N | 123.4E | 211-37 | 096-103 |
| 051800Z | 20.5N | 122.9E | 330-63 | 111-96 |
| 060000Z | 21.1N | 122.3E | 157-50 | 055-54 |
| 060600Z | 21.7N | 121.8E | 187-35 | 209-120 |
| 061200Z | 22.2N | 121.6E | 193-98 | 189-145 |
| 061800Z | 22.7N | 121.5E | 255-75 | 206-78 |
| 070000Z | 23.0N | 121.5E | 333-25 | 229-74 |
| 070600Z | 23.5N | 121.4E | 340-129 | 085-126 |
| 071200Z | 24.2N | 121.2E | 338-151 | 072-125 |
| 071800Z | 24.8N | 120.0E | 015-58 | 288-150 |
| 080000Z | 25.1N | 119.2E | 049-76 | 033-159 |
| 080600Z | 25.4N | 118.6E | 048-108 | 015-310 |
| 081200Z | 25.6N | 118.4E | 045-130 | 015-337 |

AVERAGE 24 HOUR ERROR 74 MI
AVERAGE 48 HOUR ERROR 138 MI


24 HR FORECAST POSITS
TYPHOON JUNE
01-08 AUGUST 1961
Legend
24 HR FORECAST POSITS
6 HR BEST TRACK POSITS
08/00Z
07/00Z
06/00Z
05/00Z
04/00Z
03/00Z
02/00Z
SHANGHAI
HONG KONG
MANILA
OKINAWA
CHICHI JIMA
IWO JIMA
SAIPAN
GUAM
YAP
ULITHI
KOROR
WOLEAI ATOLL
120°
130°
140°
150°
30°
20°
10°
0°